

[CMSC 425/525] Assignment #3: Mutation Coverage

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Due: End of Day, March 26th, 2023

Download and install the PITest mutation testing tool. Enclose the following method in a class, and come up with an initial set of at least 3 test cases.

```
/**
 * Calculate the number of Days between the two given days in
 * the same year.
 * preconditions : day1 and day2 must be in same year
 * 1 <= month1, month2 <= 12
 * 1 <= day1, day2 <= 31
 * month1 <= month2
 * The range for year: 1 ... 10000
 */
public static int cal(int month1, int day1, int month2,
                     int day2, int year)
{
    int numDays;

    if (month2 == month1) // in the same month
        numDays = day2 - day1;
    else
    {
        // Skip month 0.
        int daysIn[] = {0, 31, 0, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31};
        // Are we in a leap year?
        int m4 = year % 4;
        int m100 = year % 100;
        int m400 = year % 400;
        if ((m4 != 0) || ((m100 == 0) && (m400 != 0)))
            daysIn[2] = 28;
        else
            daysIn[2] = 29;

        // start with days in the two months
        numDays = day2 + (daysIn[month1] - day1);

        // add the days in the intervening months
        for (int i = month1 + 1; i <= month2-1; i++)
            numDays = daysIn[i] + numDays;
    }
    return (numDays);
}
```

1. How many mutants are there? 3
2. How many test cases do you need to kill the non-equivalent mutants? 6
3. What mutation coverage were you able to achieve before analyzing for equivalent mutants?
4. How many equivalent mutants are there? 2, ((m100 == 0) and (m400 != 0))

Turn in your Java code and associated graphs as an additional document in a format I can easily open (e.g. MS Word, PDF).